



*Image*

Docket No.: M4065.0067/P067  
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:  
Warren M. Farnworth

Application No.: 09/118,080

Art Unit: 2827

Filed: July 17, 1998 (RCE)

Examiner: A. Chambliss

For: LEAD OVER CHIP SEMICONDUCTOR  
DEVICES WITH A BALL GRID ARRAY

**REQUEST FOR RECONSIDERATION**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

Responsive to the Office Action dated October 20, 2003, please reconsider the above-referenced application in light of the following remarks. Claims 1-7 and 10-33 are pending in the application. Claims 19-30 are withdrawn from further consideration.

Claims 1, 2, 4-7, 10-14 and 16-18 are rejected under 35 U.S.C. § 103 as being unpatentable over Heo in view of Master Bond Polymer System EP31. Reconsideration is respectfully requested. Claim 1 recites a semiconductor device that comprises a low temperature curing adhesive material. According to claim 1, the adhesive material "cures to about ninety percent of its maximum strength within two to three hours without

exceeding one hundred fifty degrees Fahrenheit.” The low temperature curing aspect of the recited adhesive material is an important feature of the claimed invention. Among other things, it “avoid[s] misalignment between [a] chip and [a] single dielectric layer,” as discussed previously.

Heo refers to a semiconductor package comprising a chip 11, an epoxy adhesive 30, and a non-conductive film 21. Heo fails to disclose or suggest an adhesive material that “cures to about ninety percent of its maximum strength within two to three hours without exceeding one hundred fifty degrees Fahrenheit.” The Office Action contends it would have been obvious to substitute the Master Bond adhesive for the Heo adhesive 30. The motivation for such substitution, according to the Office Action, would have been to provide “high peel strength and good adhesion” between the Heo chip 11 and film 21 (Office Action, page 3).

Please note, however, that many structural adhesives could be said to have “high peel strength and good adhesion.” To argue, as the Office Action does, that it would have been obvious to substitute the Master Bond adhesive for the Heo adhesive 30 because the Master Bond adhesive is a “good” adhesive, is simply another way of arguing that it would have been obvious to try all adhesives as possible substitutes for the Heo adhesive 30. It is well settled that such an obvious to try analysis does not lead to a proper prima facie case of obviousness.

In In re Fine, 837 F.2d 1071 (Fed. Cir. 1988) (copy enclosed), the PTO had a primary reference that disclosed a chromatograph, a combustion means, and a sulfur detector, and a secondary reference that taught a nitric oxide detector. According to the

PTO, "substitution of one type of detector for another . . . would have been within the skill of the art." Id. at 1074; accord M.P.E.P. § 2143.01, page 2100-125. The U.S. Court of Appeals for the Federal Circuit reversed the PTO and agreed with the applicant that such an "obvious to try" analysis was "unacceptable." 837 F.2d at 1074. In re Fine would not have been decided differently if the secondary reference had added that its detector was a "good" detector. Likewise, in the present case, the fact that the Master Bond adhesive is said to have "good" adhesive properties provides no sufficient reason to substitute it for the Heo adhesive 30.

The Office Action also notes that the Master Bond adhesive is said to be a "superb electrical insulator." This adds nothing in terms of motivation, however, since there is nothing in the references, considered singly or together, to suggest that it would have been of any advantage to have a "superb electrical insulator" between the Heo chip 11 and film 21. The Heo film 21 was already non-conductive (Heo, column 5, line 48).

Claims 2-7 depend from claim 1 and should be allowable along with claim 1 and for other reasons. Claims 10-12 each recite adhesive material that "cures to about ninety percent of its maximum strength within twenty four to thirty six hours at room temperature." Claims 13-18 each recite adhesive material that is "capable of curing to about ninety percent of its maximum strength within two to three hours without exceeding one hundred fifty degrees Fahrenheit so as to avoid misalignment." Claims 10-18 should be allowable for reasons similar to those given in connection with claim 1, and there are other reasons why the claims should be allowable.

Claims 31-33 are rejected under 35 U.S.C. § 103 as being unpatentable over Heo in view of Akagawa. Reconsideration is respectfully requested. Claim 31 recites an anisotropically conductive adhesive material. The adhesive material is located between a dielectric layer and a chip. The adhesive material of claim 31 may be used, for example, in the system shown in Fig. 8 of the present application, to provide electrical connections between holes 80 and pads 78, although the claimed invention should not be limited to the system shown in Fig. 8.

Heo fails to disclose or suggest an anisotropically conductive adhesive material. The Office Action contends it would have been obvious to substitute an anisotropically conductive adhesive material for the Heo adhesive 30. The motivation for such substitution, according to the Office Action, would have been to provide a “bonding material” between the chip 11 and film 21 (Office Action, page 12). But the Heo device already has a “bonding material” (the adhesive 30) between the the chip 11 and film 21. The rejection of claim 31 is like the rejection of claim 1. It amounts to nothing more than an argument that it would have been obvious to try any and all materials that are “bonding materials” as a possible substitute for the Heo adhesive. As discussed above, such an obvious to try analysis is not a proper basis for a § 103 rejection.

The Office Action also makes an argument, on page 12, with respect to providing insulation and electrical connections: “Furthermore, the anisotropically conductive adhesive functions as an insulating material which provides an additional source of electrical connection for the semiconductor device.” This argument is not understood. It is not understood which “semiconductor device” the Office Action is referring to, or why the adhesive would be considered an “additional” source of electrical

connection. Applicant respectfully submits that there is nothing in the references, whether considered singly or together, to suggest any reason or advantage as to why an anisotropically conductive adhesive should be substituted for the Heo adhesive 30 between the chip 11 and the non-conductive film 21.

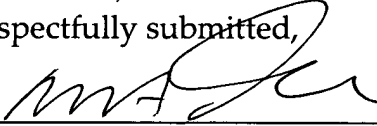
Claims 32 and 33 depend from claim 31 and should be allowable along with claim 31 and for other reasons.

The Examiner's attention is directed to the Notice of References Cited (copy enclosed) mailed by the PTO as part of Paper No. 11 in Divisional Application No. 09/620,991. Copies of the Japanese documents listed therein were not provided to Applicant. Applicant presumes the documents are not considered material to the present application since they have not been made of record by the Examiner in the present application.

Allowance of the present application is solicited.

Dated: November 17, 2003

Respectfully submitted,

By 

Mark J. Thronson

Registration No.: 33,082

DICKSTEIN SHAPIRO MORIN &  
OSHINSKY LLP

2101 L Street NW

Washington, DC 20037-1526

(202) 785-9700

Attorneys for Applicant

In re David H. Fine  
No. 87-1319

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

837 F.2d 1071; 1988 U.S. App. LEXIS 686; 5 U.S.P.Q.2D (BNA)1596

January 26, 1988, Decided

**PRIOR HISTORY: [\*\*1]**

Appealed from: Board of Patent Appeals and Interferences of the United States Patent and Trademark Office.

**CASE SUMMARY:**

**PROCEDURAL POSTURE:** Plaintiff appealed from a decision of the Board of Patent Appeals and Interferences of the United States Patent and Trademark Office, affirming the rejection of certain claims of his patent application, and concluding his invention was not patentable under 35 U.S.C.S. § 103.

**OVERVIEW:** Plaintiff challenged the appeals board's rejection of certain claims of his patent application, and the conclusion that his invention would have been obvious to one of ordinary skill in the art and was not patentable under 35 U.S.C.S. § 103. Plaintiff argued the government did not establish a prima facie case of obviousness, and contended the references applied in reviewing his application were improperly combined, using hindsight reconstruction, without evidence to support the combination and contrary to teachings in the prior art. The court determined that the primary basis for the board's affirmance of the rejection was that it would have been obvious to try plaintiff's claims in a certain system, without offering any support for or explanation of the conclusion, which was not a legitimate test of patentability. The court held that the board erred in affirming the rejection of plaintiff's claims and of his application as unpatentable, and reversed.

**OUTCOME:** The court held that the board erred in affirming the rejection of plaintiff's claims and of his application as unpatentable, and reversed because the government did not establish a prima facie case of obviousness.

**CORE TERMS:** compound, invention, nitrogen, nitric oxide, sulfur, detector, examiner, obviousness, teaching, gaseous, flame, skill, teach, chromatograph, temperature, prima facie case, sulfur dioxide, measurement, conversion, detect, unpatentable, skilled, concentration, substitution, constituent, measuring, hindsight, measured, mixture, liquid

**LexisNexis (TM) HEADNOTES - Core Concepts:**

Patent Law: Nonobviousness: Tests & Proof of Obviousness

Patent Law: Jurisdiction & Review: Standards of Review

[HN1] Obviousness under 35 U.S.C.S. § 103 is a legal conclusion based on factual evidence. An obviousness determination is not reviewed under the clearly erroneous standard applicable to fact findings, it is reviewed for correctness or error as a matter of law.

Patent Law: Nonobviousness: Tests & Proof of Obviousness

Patent Law: Nonobviousness: Date of Invention

[HN2] To reach a proper conclusion under 35 U.S.C.S. § 103, the decisionmaker must step backward in time and into the shoes worn by a person having ordinary skill in the art when the invention was unknown and just before it was made. In light of all the evidence, the decisionmaker must then determine whether the claimed invention as a whole would have been obvious at that time to that person.

Patent Law: Nonobviousness: Tests & Proof of Obviousness

837 F.2d 1071, \*, 1988 U.S. App. LEXIS 686, \*\*;  
5 U.S.P.Q.2D (BNA) 1596

Patent Law: U.S. Patent & Trademark Office Prosecution Procedures: Examination of Applications

Patent Law: U.S. Patent & Trademark Office Prosecution Procedures: Appeals

[HN3] The United States Patent and Trademark Office has the burden under 35 U.S.C.S. § 103 to establish a prima facie case of obviousness. It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references.

Patent Law: Nonobviousness: Tests & Proof of Obviousness

Patent Law: U.S. Patent & Trademark Office Prosecution Procedures: Examination of Applications

[HN4] Whether a particular combination might be obvious to try is not a legitimate test of patentability.

Patent Law: Nonobviousness: Tests & Proof of Obviousness

Patent Law: U.S. Patent & Trademark Office Prosecution Procedures: Examination of Applications

[HN5] One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to depreciate the claimed invention.

Patent Law: Nonobviousness: Tests & Proof of Obviousness

Patent Law: Specification & Claims: Claim Language

[HN6] Dependent claims are nonobvious under 35 U.S.C.S. § 103 if the independent claims from which they depend are nonobvious.

COUNSEL: Morris Relson, Darby & Darby, P.C., argued for Appellant. With him on the brief was Beverly B. Goodwin.

Lee E. Barrett, Associate Solicitor, Office of the Solicitor, argued for Appellee. With him on the brief were Joseph F. Nakamura, Solicitor and Fred E. McKelvey, Deputy Solicitor.

JUDGES: Friedman, Smith, and Mayer, Circuit Judges. Smith, Circuit Judge, dissenting.

OPINIONBY: MAYER

OPINION: [\*1072] MAYER, Circuit Judge.

David H. Fine appeals from a decision of the Board of Patent Appeals and Interferences of the United States Patent and Trademark Office (Board) affirming the rejection of certain claims of his application, Serial No. 512,374, and concluding that his invention would have been obvious to one of ordinary skill in the art and was therefore unpatentable under 35 U.S.C. § 103. We reverse.

#### Background

##### A. The Invention.

The invention claimed is a system for detecting and measuring minute quantities of nitrogen compounds. According to Fine, the system has the ability to detect the presence of nitrogen compounds in quantities[\*\*2] as minute as one part in one billion, and is an effective means to detect drugs and explosives, which emanate nitrogen compound vapors even when they are concealed in luggage and closed containers.

The claimed invention has three major components: (1) a gas chromatograph which separates a gaseous sample into its constituent parts; (2) a converter which converts the nitrogen compound effluent output of the chromatograph into nitric oxide in a hot, oxygen-rich environment; and (3) a detector for measuring the level of nitric oxide. The claimed invention's sensitivity is achieved by combining nitric oxide with ozone to produce nitrogen dioxide which concurrently causes a detectable luminescence. The luminescence, which is measured by a visual detector, shows the level of nitric oxide which in turn is a measure of nitrogen compounds found in the sample.

The appealed claims were rejected by the Patent and Trademark Office (PTO) under 35 U.S.C. § 103. Claims 60, 63, 77 and 80 were rejected as unpatentable over Eads, Patent No. 3,650,696 (Eads) in view of Warnick, et al., Patent No.

3,746,513 (Warnick). Claims 62, 68, 69, 79, 85 and 86 were rejected as unpatentable[\*\*3] over Eads and Warnick in view of Glass, et al., Patent No. 3,207,585 (Glass).

## B. The Prior Art.

### 1. Eads Patent.

Eads discloses a method for separating, identifying and quantitatively monitoring [\*1073] sulfur compounds. The Eads system is used primarily in "air pollution control work in the scientific characterization of odors from sulfur compounds."

The problem addressed by Eads is the tendency of sulfur compounds "to adhere to or react with the surface materials of the sampling and analytical equipment, and/or react with the liquid or gaseous materials in the equipment." Because of this, the accuracy of measurement is impaired. To solve the problem, the Eads system collects an air sample containing sulfur compounds in a sulfur-free methanol solution. The liquid is inserted into a gas chromatograph which separates the various sulfur compounds. The compounds are next sent through a pyrolysis furnace where they are oxidized to form sulfur dioxide. Finally, the sulfur dioxide passes through a measuring device called a microcoulometer which uses titration cells to calculate the concentration of sulfur compounds in the sample.

### 2. Warnick Patent.

Warnick[\*\*4] is directed to a means for detecting the quantity of pollutants in the atmosphere. By measuring the chemiluminescence of the reaction between nitric oxide and ozone, the Warnick device can detect the concentration of nitric oxide in a sample gaseous mixture.

Warnick calls for "continuously flowing" a sample gaseous mixture and a reactant containing ozone into a reaction chamber. The chemiluminescence from the resulting reaction is transmitted through a light-transmitting element to produce continuous readouts of the total amount of nitric oxide present in the sample.

### 3. Glass Patent.

The invention disclosed in Glass is a device for "completely burning a measured amount of a substance and analyzing the combustion products." A fixed amount of a liquid petroleum sample and oxygen are supplied to a flame. The flame is then spark-ignited, causing the sample to burn. The resulting combustion products are then collected and measured, and from this measurement the hydrogen concentration in the sample is computed.

## C. The Rejection.

The Examiner rejected claims 60, 63, 77 and 80 because "substitution of the [nitric oxide] detector of Warnick for the sulfur detector of Eads[\*\*5] would be an obvious consideration if interested in nitrogen compounds, and would yield the claimed invention." He further asserted that "Eads teaches the [claimed] combination of chromatograph, combustion, and detection, in that order. . . . Substitution of detectors to measure any component of interest is well within the skill of the art." In rejecting claims 62, 68, 69, 79, 85 and 86, the Examiner said, "Glass et al. teach a flame conversion means followed by a detector, and substitution of the flame conversion means of Glass et al. for the furnace of Eads would be an obvious equivalent and would yield the claimed invention." The Board affirmed the Examiner's rejection.

## Discussion

### A. Standard of Review.

[HN1] Obviousness under 35 U.S.C. § 103 is "a legal conclusion based on factual evidence." *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1535, 218 USPQ 871, 876 (Fed. Cir. 1983) (quoting *Stevenson v. Int'l Trade Comm'n*, 612 F.2d 546, 549, 204 USPQ 276, 279, 67 C.C.P.A. 109 (CCPA 1979)). Therefore, an obviousness determination[\*\*6] is not reviewed under the clearly erroneous standard applicable to fact findings, *Raytheon Co. v.*



837 F.2d 1071, \*; 1988 U.S. App. LEXIS 686, \*\*;  
5 U.S.P.Q.2D (BNA) 1596

Roper Corp., 724 F.2d 951, 956, 220 USPQ 592, 596 (Fed. Cir. 1983); it is "reviewed for correctness or error as a matter of law." In re De Blauwe, 736 F.2d 699, 703, 222 USPQ 191, 195 (Fed. Cir. 1984).

[HN2] To reach a proper conclusion under § 103, the decisionmaker must step backward in time and into the shoes worn by [a person having ordinary skill in the art] when the invention was unknown and just before it was made. In light of all the evidence, the decisionmaker must then determine whether . . . the claimed invention as a whole would have been [\*1074] obvious at that time to that person. 35 U.S.C. § 103. The answer to that question partakes more of the nature of law than of fact, for it is an ultimate conclusion based on a foundation formed of all the probative facts.

Panduit Corp. v. Dennison Mfg. Co., 810 F.2d 1561, 1566, 1 USPQ2d 1593, 1595-96 (Fed. Cir. 1987).

#### B. Prima[\*\*7] Facie Obviousness.

Fine says the PTO has not established a prima facie case of obviousness. He contends the references applied by the Board and Examiner were improperly combined, using hindsight reconstruction, without evidence to support the combination and in the face of contrary teachings in the prior art. He argues that the appealed claims were rejected because the PTO thought it would have been "obvious to try" the claimed invention, an unacceptable basis for rejection.

We agree. [HN3] The PTO has the burden under section 103 to establish a prima facie case of obviousness. See In re Piasecki, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-87 (Fed. Cir. 1984). It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. In re Lalu, 747 F.2d 703, 705, 223 USPQ 1257, 1258 (Fed. Cir. 1984); see also Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 297 n. 24, 227 USPQ 657, 667 n.24 (Fed. Cir. 1985);[\*\*8] ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). This it has not done. The Board points to nothing in the cited references, either alone or in combination, suggesting or teaching Fine's invention.

The primary basis for the Board's affirmance of the Examiner's rejection was that it would have been obvious to substitute the Warnick nitric oxide detector for the Eads sulfur dioxide detector in the Eads system. The Board reiterated the Examiner's bald assertion that "substitution of one type of detector for another in the system of Eads would have been within the skill of the art," but neither of them offered any support for or explanation of this conclusion.

Eads is limited to the analysis of sulfur compounds. The particular problem addressed there is the difficulty of obtaining precise measurements of sulfur compounds because of the tendency of sulfur dioxide to adhere to or react with the sampling analytic equipment or the liquid or gaseous materials in the equipment. It solves this problem by suggesting that the gaseous sample containing sulfur compounds be absorbed into sulfur-free methanol and then inserted into[\*\*9] a gas chromatograph to separate the sulfur compounds.

There is no suggestion in Eads, which focuses on the unique difficulties inherent in the measurement of sulfur, to use that arrangement to detect nitrogen compounds. In fact, Eads says that the presence of nitrogen is undesirable because the concentration of the titration cell components in the sulfur detector is adversely affected by substantial amounts of nitrogen compounds in the sample. So, instead of suggesting that the system be used to detect nitrogen compounds, Eads deliberately seeks to avoid them; it warns against rather than teaches Fine's invention. See W. L. Gore & Assoc. v. Garlock, Inc., 721 F.2d 1540, 1550, 220 USPQ 303, 311 (Fed. Cir. 1983) (error to find obviousness where references "diverge from and teach away from the invention at hand"). In the face of this, one skilled in the art would not be expected to combine a nitrogen-related detector with the Eads system. Accordingly, there is no suggestion to combine Eads and Warnick.

Likewise, the teachings of Warnick are inconsistent with the claimed invention, to some extent. The Warnick claims are directed to a gas stream from engine exhaust[\*\*10] "continuously flowing the gaseous mixtures into the reaction chamber" to obtain "continuous readouts" of the amount of nitric oxide in the sample. In other words, it contemplates measuring the total amount of nitric oxide in a continuously flowing gaseous mixture of unseparated nitrogen constituents. By contrast, in Fine each [\*1075] nitrogen compound constituent of the gaseous sample is retained in the

chromatograph for an individual time period so that each exits in discrete, time-separated pulses. \* By this process, each constituent may be both identified by its position in time sequence, and measured. The claimed system, therefore, diverges from Warnick and teaches advantages not appreciated or contemplated by it.

-----Footnotes-----

\* The Solicitor argues that the contents of Attachment C of Fine's brief were not before the Board and may not properly be considered here. However, we need not rely on Attachment C. It is merely illustrative of the qualitative separation of nitrogen compounds which occurs in Fine's system. The fact that the various constituents exit at discrete intervals is shown by the specification which was before the Board and which may appropriately be considered on appeal. See, e.g., *Astra-Sjuco, A.B. v. United States Int'l Trade Comm'n*, 67 C.C.P.A. 128, 629 F.2d 682, 686, 207 USPQ 1, 5 (CCPA 1980) (claims must be construed in light of specification).

-----End Footnotes-----

[\*\*11]

Because neither Warnick nor Eads, alone or in combination, suggests the claimed invention, the Board erred in affirming the Examiner's conclusion that it would have been obvious to substitute the Warnick nitric oxide detector for the Eads sulfur dioxide detector in the Eads system. *ACS Hosp. Sys.*, 732 F.2d at 1575-77, 221 USPQ at 931-33. The Eads and Warnick references disclose, at most, that one skilled in the art might find it obvious to try the claimed invention. [HN4] But whether a particular combination might be "obvious to try" is not a legitimate test of patentability. In *re Geiger*, 815 F.2d 686, 688, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987); In *re Goodwin*, 576 F.2d 375, 377, 198 USPQ 1, 3 (CCPA 1978).

Obviousness is tested by "what the combined teachings of the references would have suggested to those of ordinary skill in the art." In *re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). But it "cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching[\*\*12] or suggestion supporting the combination." *ACS Hosp. Sys.*, 732 F.2d at 1577, 221 USPQ at 933. And "teachings of references can be combined only if there is some suggestion or incentive to do so." *Id.* Here, the prior art contains none.

Instead, the Examiner relies on hindsight in reaching his obviousness determination. But this court has said, "To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher." *W.L. Gore*, 721 F.2d at 1553, 220 USPQ at 312-13. It is essential that "the decisionmaker forget what he or she has been taught at trial about the claimed invention and cast the mind back to the time the invention was made . . . to occupy the mind of one skilled in the art who is presented only with the references, and who is normally guided by the then-accepted wisdom in the art." *Id.* [HN5] One cannot use[\*\*13] hindsight reconstruction to pick and choose among isolated disclosures in the prior art to depreciate the claimed invention.

#### C. Advantage Not Appreciated by the Prior Art.

The Board erred not only in improperly combining the Eads and Warnick references but also in failing to appreciate that the appealed claims can be distinguished over that combination. A material limitation of the claimed system is that the conversion to nitric oxide occur in the range of 600 degrees C to 1700 degrees C. The purpose of this limitation is to prevent nitrogen from other sources, such as the air, from being converted to nitric oxide and thereby distorting the measurement of nitric oxide derived from the nitrogen compounds of the sample.

The claimed nitric oxide conversion temperature is not disclosed in Warnick. Although Eads describes a preferred temperature of 675 degrees C to 725 degrees C, the purpose of this range is different from that of Fine. Eads requires the 675 degrees C to 725 degrees C range because it affords a temperature low enough to avoid formation of unwanted sulfur trioxide, yet high enough to avoid formation of unwanted sulfides. Fine's temperature [\*1076] range, in contrast, [\*\*14] does not seek to avoid the formation of sulfur compounds or even nitrogen compounds. It enables the system to break down the nitrogen compounds of the sample while avoiding the destruction of background nitrogen gas. There is a partial overlap, of course, but this is mere happenstance. Because the purposes of the two temperature ranges are entirely unrelated, Eads does not teach use of the claimed range. See *In re Geiger*, 815 F.2d at 688, 2 USPQ2d at 1278. The Board erred by concluding otherwise.

D. Unexpected Results.

Because we reverse for failure to establish a prima facie case of obviousness, we need not reach Fine's contention that the Board failed to accord proper weight to the objective evidence of unexpected superior results. *Id.*

E. The "Flame" Claims.

Claims 62, 68, 69, 79, 85 and 86 relate to the oxygen-rich flame conversion means of the claimed invention. These "flame" claims depend from either apparatus claim 60 or method claim 77. [HN6] Dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious. [\*\*15] *Hartness Int'l, Inc. v. Simplimatic Eng'g Co.*, 819 F.2d 1100, 1108, 2 USPQ2d 1826, 1831 (Fed. Cir. 1987); *In re Abele*, 684 F.2d 902, 910, 214 USPQ 682, 689 (CCPA 1982); see also *In re Sernaker*, 702 F.2d 989, 991, 217 USPQ 1, 3 (Fed. Cir. 1983). In view of our conclusion that claims 60 and 77 are nonobvious, the dependent "flame" claims are also patentable.

Conclusion

The Board's decision affirming the Examiner's rejection of claims 60, 62, 63, 68, 69, 77, 79, 80, 85 and 86 of Fine's application as unpatentable over the prior art under 35 U.S.C. § 103 is

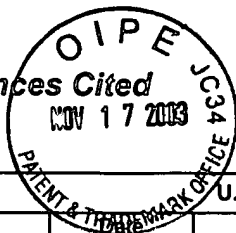
REVERSED.

DISSENTBY: SMITH

DISSENT: SMITH, Circuit Judge, dissenting.

I respectfully dissent. I am of the firm belief that the prior art references, relied upon by the PTO to establish its prima facie case of obviousness, in combination teach and suggest Fine's invention to one skilled in the art. Also, I firmly believe that Fine failed to rebut the PTO's prima facie case. On this basis, I would affirm the board's determination sustaining the examiner's rejection, pursuant to 35 U.S.C. § 103, of Fine's claims on appeal before[\*\*16] this court.

# Notice of References Cited



Application/Control No.

09/620,991

Applicant(s)/Patent Under  
Reexamination  
FARNWORTH, WARREN M.

Examiner

Alonzo Chambliss

Art Unit

2827

Page 1 of 1

## U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	MM-YYYY	Name	Classification
	A	US-			
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

COPY

## FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
*	N	JP 62-249459	10-1987	Japan	Komiya	
*	O	JP 63-306646	12-1988	Japan	Arai	
	P					
	Q					
	R					
	S					
	T					

## NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.